

An Experiment for Carbon Dioxide Sequestration

Lesson plan
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For the Mon Valley Educational Consortium's
Educator in the Workplace 2001

Background: NETL'S role in carbon sequestration is to stabilize atmospheric carbon dioxide levels. NETL is currently researching the following methods of carbon sequestration: Capture and storage, Geological sequestration, Ocean sequestration, Terrestrial sequestration, and advanced carbon dioxide conversion and reuse. More information can be found at <http://www.netl.doe.gov/products/sequestration/index.html>

I spent my summer working with Dr. Jones, Dr. Ken LaSota, Mr. Don Harrison, and Ms. Joann Corrigan. I learned a lot about the need for finding a way to store carbon dioxide that is admitted from burning fossil fuels and automobiles. Nature does have ways of dealing with carbon dioxide, but not at the levels we humans produce. Dr. Jones is a geologist. He and the others are working on sequestering carbon dioxide in brackish sea basins that are deeper than 800 meters. It is their hope that the carbon dioxide will remain in a liquid state and create new minerals. In the following experiment we will take Carbon Dioxide (alka seltzer tablets) and add them into a lime water mixture. A gas will be released and enter through the mixture, excess gases will be forced into a balloon. The result will be a cloudy precipitate at the bottom of the jar. This experiment is designed for elementary students in grades four through eight.

Objectives:

1. To have students explain the need for carbon dioxide sequestration.
2. To have students give an example of what carbon dioxide sequestration is.

Materials:

Alka Seltzer tablets (4 per experiment works best)

Scissors

Modeling clay

Two plastic containers at least one with a lid (I used a peanut butter jar and water bottle)

A spoon

Quick lime

Aquarium tubing

A balloon

Water

Paper towels and safety goggles



Procedure:

- A. Wear the safety goggles
 - B. In the larger container with the lid (the lid needs two holes poked through it), mix a teaspoonful of quick lime into half a jar of warm tap water. Let the solution sit
 - C. Put some tap water in to the other bottle.
1. Put plastic tubing through the holes in the lid. Use the modeling clay to secure the tubing and prevent air from escaping.
 2. Attach the lid to the lime water solution. One piece of tubing should be long and extend from about an inch from the bottom of the jar over and into the other bottle of water.
 3. Attach a balloon to the short piece of tubing; use a large piece of clay to secure the balloon to the tubing.
 4. Break up four pieces of alka seltzer.
 5. Put the alka seltzer into the water.
 6. Firmly secure the tubing with clay around the top of the bottle. The tubing does not have to extend to the bottom.
 7. At this time the carbon should be traveling via the tube into the limewater. The excess gas will be forced into the balloon.



The students can measure the amount of carbon sequestered; by first measuring the amount of lime put into the water. They will then measure the amount of the mixture at the bottom of the jar, when the experiment is over.